

REMARKS

Claims 1-15 and 21 are pending in the present application. Claims 1-2, 4-15 and 21 are rejected. Claims 1-2, 8-9 and 21 are herein amended. No new matter has been entered.

Claim Rejections – 35 U.S.C. §102

Claims 1, 6, 8, 10, 12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by *JP-09252131-A*.

Claim 1 is herein amended so as to include the limitation that the interface between the semiconductor substrate and the gate insulation film contains less hydrogen termination.

In the present invention according to claim 1, hydrogen termination of an interface between the semiconductor substrate and the gate insulation film by hydrogen annealing is homogeneously suppressed by the metal layer formed of a metal material having the property of occluding hydrogen. This suppression leads to the interface containing less hydrogen termination. In the present invention, the metal layer is provided over the gate electrode so as to suppress hydrogen termination of the interface and thus avoid inhomogeneous hydrogen termination of the interface. No compensation for the suppression of the hydrogen termination is performed in the present invention. Accordingly, it is evident that the interface contains less hydrogen termination. Due to the suppression of hydrogen termination by the metal layer and the resultant less hydrogen termination of the interface, inhomogeneous hydrogen termination of the interface between the semiconductor substrate and the gate insulation film never takes place, and the transistor can have high relative accuracy.

On the other hand and as previously discussed in the response to the previous Office Action, *JP-09252131-A* discloses that dangling bonds at the interface between a substrate surface and a gate insulation film are sufficiently terminated by setting hydrogen concentration of annealing atmosphere considering hydrogen amount occluded by titanium layer formed over a MOS transistor. Moreover, *JP-09252131-A* discloses not only the case where the cover layer 16Q is formed over gate the electrode as shown in FIGs. 7 and 11 but also the case where the source and drain interconnection layers 16S and 16D are formed near the gate electrode T_g without the cover layer 16Q as shown in FIGs. 14 and 15. The invention disclosed in *JP-09252131-A* is related to a technique for sufficiently terminating an interface between a substrate surface and a gate insulation film when a hydrogen occluding metal layer is formed not only over a gate electrode but also near the interface. Namely, the invention disclosed in *JP-09252131-A* has no connection with the suppression of hydrogen termination which leads to the interface containing less hydrogen termination. It is clear that the terminated state of the interface in *JP-09252131-A* is exactly the opposite to that of the present invention.

As described above, Applicants submit that the invention according to claim 1, as herein amended, is substantially different form the invention disclosed in *JP-09252131-A* in terms of the amount of the hydrogen termination the interface contains. Accordingly, it is clear that the present invention according to claim 1 and its dependent claims 6, 8, 10, 12 and 14 is not anticipated by *JP-09252131-A*.

Regarding Claim Rejections – 35 U.S.C. §103(a)

Claims 2, 7, 9, 11, 13, 15 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over *JP-09252131-A* and further in view of *Lockwood (U.S. Patent No. 3,996,482)*.

Claim 2 is herein amended in the same way as claim 1 so as to include the limitation that the interfaces between the semiconductor substrate and the first and the second gate insulation films contains less hydrogen termination.

The argument as regarding claim 1 is herein applied to conclude that the present invention according to claim 2 is substantially different from *JP-09252131-A* in terms of the amount of the hydrogen termination the interfaces contain.

Therefore, even if *JP-09252131-A* was combined with *Lockwood* simply disclosing multiple transistors, it is clear that the present invention according to claim 2, and its dependent claims 7, 9, 11, 13, 15 and 21 would have been unobvious to one of ordinary skill in the art at the time the invention was made.

Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over *JP-09252131-A* and further in view of *Dixit et al. (US 2002/0185664 A1)*.

As described above, *JP-09252131-A* fails to disclose all the features of the present invention according to claim 1, and it is clear that the present invention according to claim 1 cannot be anticipated by *JP-09252131-A*.

Therefore, even if *JP-09252131-A* was combined with *Dixit et al.* teaching the connection of dummy metal to ground, it is clear that the present invention according to claim 4

dependent from claim 1 would have been unobvious to one of ordinary skill in the art at the time the invention was made.

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over JP-09252131-A in view of Lockwood (U.S. Patent No. 3,996,482) and further in view of Dixit et al. (US 2002/0185664 A1).

As described above, even if JP-09252131-A was combined with Lockwood, it is clear that the present invention according to claim 2 would not have been reached.

Therefore, even if JP-09252131-A was combined with Lockwood and further with Dixit et al. teaching the connection of dummy metal to ground, it is clear that the present invention according to claim 5 dependent from claim 2 would have been unobvious to one of ordinary skill in the art at the time the invention was made.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

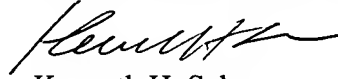
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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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